

1 (Currently Amended): A prepared heterogeneous DNA segment for placement in an expression vector capable of effecting transfection of endothelial cells in-situ such that overexpression of extracellular matrix heparan sulphate proteoglycans subsequently occurs in-situ, said prepared heterogeneous DNA segment comprising:

at least one first DNA sequence coding for the extracellular domain of a recombinant proteoglycan entity that is not a naturally occurring form of a syndecan-4 molecule, and which can be expressed by a transfected endothelial cell in-situ after being transfected with an expression vector carrying said first DNA sequence, said extracellular domain first DNA sequence specifying the extracellular N-terminal portion of said expressed recombinant proteoglycan entity which then extends from the endothelial cell surface and is capable of binding heparan sulfates to form an extracellular matrix in-situ;

at least one second DNA sequence coding for the transmembrane domain of said recombinant proteoglycan entity that is not a naturally occurring form of a syndecan-4 molecule, and which can be expressed by a transfected endothelial cell in-situ after being transfected with an expression vector carrying said second DNA sequence, said transmembrane domain second DNA sequence specifying the medial portion of said expressed recombinant proteoglycan entity which then extends through the endothelial cell membrane and is joined with said

extracellular N-terminal portion of said expressed recombinant proteoglycan entity; and

at least one third DNA sequence coding for the cytoplasmic domain of a syndecan-4 molecule in said recombinant proteoglycan entity, and which can be expressed by a transfected endothelial cell in-situ after being transfected with an expression vector carrying said third DNA sequence, said syndecan-4 cytoplasmic domain third DNA sequence specifying the cytoplasmic portion of said expressed recombinant proteoglycan entity which is then present within the cytoplasm of a transfected endothelial cell and is joined to said transmembrane portion of said expressed recombinant proteoglycan entity.

2 (Currently Amended): A constructed expression vector capable of effecting transfection of endothelial cells in-situ such that overexpression of extracellular matrix heparan sulfate proteoglycan subsequently occurs in-situ, said constructed expression vector comprising:

a prepared heterogeneous DNA segment comprised of

(i) at least one first DNA sequence coding for the extracellular domain a recombinant proteoglycan entity that is not a naturally occurring form of a syndecan-4 molecule, and which can be expressed by a transfected endothelial cell in-situ after being transfected with an expression vector carrying said first DNA sequence, said extracellular

domain first DNA sequence specifying the extracellular N-terminal portion of said expressed recombinant proteoglycan entity which then extends from the endothelial cell surface and is capable of binding heparan sulfates to form an extracellular matrix in-situ,

(ii) at least one second DNA sequence coding for the transmembrane domain of said recombinant proteoglycan entity that is not a naturally occurring form of a syndecan-4 molecule, and which can be expressed by a transfected endothelial cell in-situ after being transfected with an expression vector carrying said second DNA sequence, said transmembrane domain second DNA sequence specifying the medial portion of said expressed recombinant proteoglycan entity which then extends through the endothelial cell membrane and is joined with said extracellular N-terminal portion of said recombinant proteoglycan entity, and

(iii) at least one third DNA sequence coding for the cytoplasmic domain of a syndecan-4 molecule in said recombinant proteoglycan entity, and which can be expressed by a transfected endothelial cell in-situ after being transfected with an expression vector carrying said third DNA sequence, said syndecan-4 cytoplasmic domain third DNA sequence specifying the cytoplasmic portion of said expressed recombinant proteoglycan entity which is then present within the cytoplasm of a transfected endothelial cell and is joined to said

transmembrane portion of said expressed recombinant proteoglycan entity; and

an expression vector carrying said prepared heterogeneous DNA segment and capable of effecting transfection of endothelial cells in-situ.

3 (Currently Amended): An in-situ transfected endothelial cell which ~~comprises~~ exists as a part of a living tissue in vitro, overexpresses extracellular matrix heparan sulfate recombinant proteoglycans, and positions the recombinant proteoglycans at the endothelial cell surface, said in-situ transfected endothelial cell comprising:

a viable endothelial cell transfected in-situ with a constructed expression vector such that said transfected endothelial cell overexpresses extracellular matrix heparan sulfate recombinant proteoglycan entities that are not a naturally occurring form of a syndecan-4 molecule, said overexpressed recombinant proteoglycan entities being comprised of

(i) an extracellular N-terminal portion for said recombinant proteoglycan entity that is not a naturally occurring form of a syndecan-4 molecule and which extends from the transfected endothelial cell surface and binds heparan sulfates to form an extracellular matrix in-situ, said extracellular N-terminal portion being the expressed product of at least one first DNA sequence carried by the constructed expression vector and

coding for the extracellular domain of said recombinant proteoglycan entity expressed by the transfected endothelial cell in-situ,

(ii) a transmembrane medial portion for said recombinant proteoglycan entity that is not a naturally occurring form of a syndecan-4 molecule and which extends through the endothelial cell membrane and is joined with said extracellular N-terminal portion of said recombinant proteoglycan entity, said transmembrane medial portion being the expressed product of at least one second DNA sequence carried by the constructed expression vector and coding for the transmembrane domain of said recombinant proteoglycan entity expressed by the transfected endothelial cell in-situ, and

(iii) a syndecan-4 cytoplasmic portion for said recombinant proteoglycan entity which is present within the cytoplasm of the transfected endothelial cell and is joined to said transmembrane portion of said recombinant proteoglycan entity, said syndecan-4 cytoplasmic portion being the expressed product of at least one third DNA sequence carried by the constructed expression vector and coding for the cytoplasmic domain of the syndecan-4 molecule of said recombinant proteoglycan entity expressed by the transfected endothelial cell in-situ.

4 (Previously Amended): The prepared heterogeneous DNA segment as recited by claim 1 wherein said first DNA sequence coding for the

extracellular domain of said recombinant proteoglycan entity is selected from the group consisting of syndecan DNA sequences, glypican DNA sequences and perlecan DNA sequences.

5 (Previously Amended): The prepared heterogeneous DNA segment as recited by claim 1 wherein said second DNA sequence coding for the transmembrane domain of said recombinant proteoglycan entity is selected from the group consisting of syndecan DNA sequences, glypican DNA sequences and perlecan DNA sequences.

6 (Previously Amended): The constructed expression vector as recited by claim 2 wherein said expression vector capable of effecting transfection of endothelial cells in-situ is a plasmid.

7 (Previously Amended): The constructed expression vector as recited by claim 2 wherein said expression vector capable of effecting transfection of endothelial cells in-situ is a virus.

8 (Original). The in-situ transfected endothelial cell as recited by claim 3 wherein said cell is selected from the group consisting of vascular endothelial cells and dermal endothelial cells.

11 (Original). The in-situ transfected endothelial cell as recited by claim 3 wherein said transfected endothelial cell exists in a tissue comprising at least one kind of muscle cell selected from the group consisting of myocardial muscle cells, smooth muscle cells and striated muscle cells.

12 (Currently Amended): A method for making a prepared heterogeneous DNA segment intended for placement in an expression vector capable of effecting transfection of endothelial cells in-situ such that overexpression of extracellular matrix heparan sulfate recombinant proteoglycan entities occurs in-situ, said method comprising the steps of:

obtaining at least one first DNA sequence coding for the extracellular domain of a recombinant proteoglycan entity that is not a naturally occurring form of a syndecan-4 molecule, and which can be expressed by a transfected endothelial cell in-situ after being transfected with an expression vector carrying said first DNA sequence, said extracellular domain first DNA sequence specifying the extracellular N-terminal portion of said expressed recombinant proteoglycan entity which then extends from the transfected endothelial cell surface and is capable of binding heparan sulfates to form an extracellular matrix in-situ;

acquiring at least one second DNA sequence coding for the transmembrane domain of said recombinant proteoglycan entity that is

not a naturally occurring form of a syndecan-4 molecule, and which can be expressed by a transfected endothelial cell in-situ after being transfected with an expression vector carrying said second DNA sequence, said transmembrane domain second DNA sequence specifying the medial portion of said expressed recombinant proteoglycan entity which then extends through the transfected endothelial cell membrane and is joined with said extracellular N-terminal portion of said expressed recombinant proteoglycan entity;

procuring at least one third DNA sequence coding for the cytoplasmic domain of a syndecan-4 molecule in said recombinant proteoglycan entity, and which can be expressed by a transfected endothelial cell in-situ after being transfected with an expression vector carrying said third DNA sequence, said syndecan-4 cytoplasmic domain third DNA sequence specifying the cytoplasmic portion of said expressed recombinant proteoglycan entity which is then present within the cytoplasm of an transfected endothelial cell and is joined to said transmembrane portion of said expressed recombinant proteoglycan entity; and

joining together said extracellular domain first DNA sequence, said transmembrane domain second DNA sequence, and said syndecan-4 cytoplasmic domain third DNA sequence as a prepared heterogeneous DNA segment.



13 (Currently Amended): A method for making a constructed expression vector capable of effecting transfection of endothelial cells in-situ such that overexpression of extracellular matrix heparan sulfate recombinant proteoglycan entities subsequently occurs in-situ, said method comprising the steps of:

obtaining a prepared heterogeneous DNA segment comprised of

(i) at least one first DNA sequence coding for the extracellular domain of a recombinant proteoglycan entity that is not a naturally occurring form of a syndecan-4 molecule, and which can be expressed by a transfected endothelial cell in-situ after being transfected with an expression vector carrying said first DNA sequence, said extracellular domain first DNA sequence specifying the extracellular N-terminal portion of said expressed recombinant proteoglycan entity which then extends from the transfected endothelial cell surface and is capable of binding heparan sulfates to form an extracellular matrix in-situ,

(ii) at least one second DNA sequence coding for the transmembrane domain of said recombinant proteoglycan entity that is not a naturally occurring form of a syndecan-4 molecule, and which can be expressed by a transfected endothelial cell in-situ after being transfected with an expression vector carrying said second DNA sequence, said transmembrane domain second DNA sequence specifying the medial

portion of an expressed proteoglycan entity which then extends through the transfected endothelial cell membrane and is joined with said extracellular N-terminal portion of said expressed recombinant proteoglycan entity, and

(iii) at least one third DNA sequence coding for the cytoplasmic domain of the syndecan-4 molecule in said recombinant proteoglycan entity, and which can be expressed by a transfected endothelial cell in-situ after being transfected with an expression vector carrying said third DNA sequence, said syndecan-4 cytoplasmic domain third DNA sequence specifying the cytoplasmic portion of an expressed proteoglycan entity which is then present within the cytoplasm of said transfected endothelial cell and is joined to said transmembrane portion of said expressed recombinant proteoglycan entity; and

positioning said prepared heterogeneous DNA segment into an expression vector suitable for transfection of endothelial cells in-situ.